Abstract

Title of the thesis

Comparison of muscle activity of selected muscles of shoulder girdle by PEMG examination among elite swimmers and influence of strength training

Thesis aim

Analyze and evaluate the influence of strength intervention on muscle activity of selected muscle groups by PEMG during swimming locomotion by crawl method in top swimmers.

Methods

Fifteen top swimmers specializing in the crawl style at the age of 18-28 years participated in this experiment. After determining pain in the area of the shoulder joint using VAS (Visual Analogue Scale) and the SFPS questionnaire (Swimmer´s Functional Pain Scale), which reports about the swimming training, health and analgesic use, probands underwent a PEMG examination of 8 evaluated muscles. Subsequently, they simulated a 100m crawl race on VASA, where PEMG data was again captured. Subsequently, everyone carried out a force intervention program and then again underwent a simulation of the 100m crawl on VASA. The evaluation and processing of the obtained data was performed with the program MyoResearch XP Master Edition from Noraxon company with simultaneous video recording. Basic descriptive statistics, Magnitude Based Difference, ANOVA and Cohen D were used for statistical data processing.

Results

Muscle activity of the examined muscles increased after strength intervention in muscles of biceps brachii, upper part of m. trapezius and m. serratus anterior with low magnitude of effect according to Hopkins et al (2010) and with moderate size of effect in lower part of m. trapezius among top swimmers. Statistical processing of dissertation research data using ANOVA did not show significant

results. Magnitude Based Difference has shown a very likely positive change in m. biceps brachii. In m. deltoideus anterior and m. infraspinatus, the results are likely to be probably negative, and in m. serratus anterior and m. pectoralis major, the results are probably positive. Shoulder joint pain analysis of the dominant upper limb according to the SFPS questionnaire showed that after the intervention program, shoulder pain increased among 6 probands, of which 3 probands increased pain by more than 2 degrees.

Keywords

The shoulder joint, pain, swimming, power training, EMG, intervention